LISTING OF THE CLAIMS:

This listing of claims will replace all prior versions, and listing, of the claims in the above-identified patent application.

1. (previously presented) A method of transmitting a traffic signal with an adaptive antenna array of a base transceiver, such that a subscriber unit utilizes a non-dedicated pilot transmitted from a reference antenna element for demodulation of the traffic signal, comprising:

determining a channel impulse response from a plurality of antenna elements in operative communication with the base transceiver to a receive antenna of the subscriber unit;

computing an array weight vector that is at least a function of a reference channel impulse response of one of said plurality of antenna elements configured as ~~a~~ the reference antenna element and said channel impulse response of one of said plurality of antenna elements that is an element of the adaptive antenna array; and

transmitting the traffic signal with the adaptive antenna array configured with said adaptive array weight vector.

2. (original) The method of Claim 1, wherein determining said channel impulse response from said plurality of antenna elements comprises determining a channel impulse response from an antenna element of the adaptive antenna array.

3. (original) The method of Claim 1, wherein determining said channel impulse response from said plurality of antenna elements comprises determining a channel impulse response from more than one antenna element of the adaptive antenna array.

4. (original) The method of Claim 1, wherein computing said array weight vector accounts for a Signal to Interference plus Noise Ratio (SINR) and enables the subscriber unit to use said reference channel impulse response emitted from said reference antenna element as a demodulation reference.

5. (original) The method of Claim 1, wherein said function comprises the traffic signal power received by the subscriber unit (p_d).

6. (original) The method of Claim 5, wherein said function comprising said traffic signal power received by the subscriber unit (p_d)is:

$$p_d = \left|\mathbf{v}^H \mathbf{H}\mathbf{w}\right|^2$$

where $\mathbf{v}^H$ is the complex conjugate transpose of the multi-path combining weights ($\mathbf{v}$), $\mathbf{H}$ is a matrix with M rows and N columns containing the channel impulse response for a channel between an element of the adaptive antenna array and the subscriber unit, $\mathbf{w}$ is said adaptive array weight vector; and $|x|^2$ is the absolute value squared of the variable x.

7. (original) The method of Claim 6, wherein said adaptive array weight vector ($\mathbf{w}$) is selected to satisfy the following:

$$\mathbf{w} = \mathbf{H}^H \mathbf{v} / \left\|\mathbf{H}^H \mathbf{v}\right\|_2$$

where $\|\mathbf{x}\|_2$ is the 2-norm of a vector $\mathbf{x}$.

8. (original) The method of Claim 5, wherein said function further comprises a phase correction factor (Δ).

9. (currently amended) The method of Claim 6, wherein said function further comprising ~~said~~ a phase correction factor (Δ) is:

$$\Delta = (\mathbf{v}^H \mathbf{H}\mathbf{w})^* / \left|\mathbf{v}^H \mathbf{H}\mathbf{w}\right|.$$

10. (original) The method of Claim 1, wherein computing an array weight vector comprises selecting said reference antenna element.

11. (original) The method of Claim 10, wherein said selecting said reference antenna element comprises:

computing a first traffic signal power for a first antenna element configured as said reference antenna element;

computing second traffic signal power for a second antenna element as said reference antenna element;

comparing said first traffic signal power and said second traffic signal power; and

selecting said first antenna element as said reference antenna element if said first traffic signal power is greater than said second traffic signal power.

12. (original) The method of Claim 11, wherein said first traffic signal power is computed with a first array weight vector identified from a codebook and said second traffic signal power is computed with a second array weight vector identified from said codebook.

13. (original) The method of claim 8, further comprising applying said phase correction factor (Δ) to the traffic signal received by the subscriber unit.

14. (original) The method of claim 6, wherein said multipath combining weights ($\mathbf{v}$) are computed using:

$$\mathbf{v} = \Sigma^{-1}\mathbf{h}$$

where Σ^{-1} is a matrix with M rows and M columns representing the inverse of a noise autocorrelation matrix.

15. (original) The method of claim 13, wherein applying said phase correction factor (Δ) is delayed to account for feedback of said phase correction factor (Δ) from the subscriber unit to the base transceiver.

16. (original) The method of claim 1, further comprising transmitting an identification of said reference antenna element to the subscriber unit.

17. (original) The method of claim 1, further comprising transmitting an identification of said reference antenna element to the base transceiver.

18. (original) An apparatus for transmitting a traffic signal with an adaptive antenna array of a base transceiver such that a subscriber unit utilizes a non-dedicated pilot transmitted from a reference antenna element for demodulation of the traffic signal, comprising:

a channel impulse response estimator configured to determine a channel impulse response from a plurality of antenna elements in operative communication with the base transceiver to a receive antenna of the subscriber unit;

an array weight calculator configured to compute an array weight vector that is at least a function of a reference channel impulse response of one of said plurality of antenna elements configured as a reference antenna element and said channel impulse response of one of said plurality of antenna elements that is an element of the adaptive antenna array;

a weight decoder configured to configure the adaptive antenna array with said adaptive array weight vector.

19. (original) The apparatus of Claim 18, wherein said channel impulse response estimator is configured to determine a channel impulse response from an antenna element of the adaptive antenna array.

20. (original) The apparatus of Claim 18, wherein said channel impulse response estimator is configured to determine a channel impulse response from more than one antenna element of the adaptive antenna array.

21. (original) The apparatus of Claim 18, wherein said array weight calculator accounts for a Signal to Interference plus Noise Ratio (SINR) and enables the subscriber unit to use said reference channel impulse response emitted from said reference antenna element as a demodulation reference.

22. (original) The apparatus of Claim 18, wherein said function comprises the traffic signal power received by the subscriber unit (p_d).

23. (original) The apparatus of Claim 22, wherein said function comprising said traffic signal power received by the subscriber unit (p_d) is:

$$p_d = \left|\mathbf{v}^H \mathbf{H} \mathbf{w}\right|^2$$

where $\mathbf{v}^H$ is the complex conjugate transpose of the multi-path combining weights ($\mathbf{v}$), $\mathbf{H}$ is a matrix with M rows and N columns containing the channel impulse response for a channel between an element of the adaptive antenna array and the subscriber unit, $\mathbf{w}$ is said adaptive array weight vector; and $|x|^2$ is the absolute value squared of the variable x.

24. (original) The apparatus of Claim 23, wherein said adaptive array weight vector ($\mathbf{w}$) is selected to satisfy the following:

$$\mathbf{w} = \mathbf{H}^H \mathbf{v} / \left\|\mathbf{H}^H \mathbf{v}\right\|_2$$

where $\|x\|_2$ is the 2-norm of a vector $\mathbf{x}$.

25. (original) The apparatus of Claim 22, wherein said function further comprises a phase correction factor (Δ).

26. (currently amended) The apparatus of Claim 25, wherein ~~said function further comprising~~ said phase correction factor (Δ) is:

$$\Delta = (\mathbf{v}^H \mathbf{H} \mathbf{w})^* / \left|\mathbf{v}^H \mathbf{H} \mathbf{w}\right| [[.]]$$

where $\mathbf{v}^H$ is the complex conjugate transpose of the multi-path combining weights ($\mathbf{v}$), $\mathbf{H}$ is the matrix with M rows and N columns containing the channel impulse response for the channel between an element of the adaptive antenna array and the subscriber unit, $\mathbf{w}$ is the adaptive array weight vector; and $|x|^2$ is the absolute value squared of the variable x.

27. (original) The apparatus of Claim 18, wherein said array weight calculator is configured to select said reference antenna element.

28. (original) The apparatus of Claim 18, wherein said array weight calculator is configured to:

compute a first traffic signal power for a first antenna element configured as said reference antenna element;

compute second traffic signal power for a second antenna element as said reference antenna element;

compare said first traffic signal power and said second traffic signal power; and

select said first antenna element as said reference antenna element if said first traffic signal power is greater than said second traffic signal power.

29. (original) The apparatus of Claim 28, wherein said first traffic signal power is computed with a first array weight vector identified from a codebook and said second traffic signal power is computed with a second array weight vector identified from said codebook.

30. (original) The apparatus of Claim 25, further comprising a multiplier configured to apply said phase correction factor (Δ) to the traffic signal received by the subscriber unit.

31. (original) The apparatus of Claim 23, wherein said multi-path combining weights ($\mathbf{v}$) are computed using:

$$\mathbf{v} = \mathbf{\Sigma}^{-1}\mathbf{h}$$

where $\mathbf{\Sigma}^{-1}$ is a matrix with M rows and M columns representing the inverse of a noise autocorrelation matrix.

32. (original) The apparatus of Claim 30, further comprising a delay element configured to receive said phase correction factor (Δ) and produce a delayed phase correction factor (Δ(t-T)) to account for feedback of said phase correction factor (Δ) from the subscriber unit to the base transceiver.